DOCUMENT RESUME

ED 306 018 PS 017 945

AUTHOR Noll, Robert B.; And Others
TITLE Young Male Offspring of Alcoholic Fathers: Early Developmental and Cognitive Findings.
SPONS AGENCY Michigan State Dept. of Mental Health, Lansing.; National Inst. on Alcohol Abuse and Alcoholism (DHHS), Rockville, Md.
PUB DATE Apr 89
GRANT AA-07065
NOTE 24p.; Paper presented at the Biennial Meeting of the Society for Research on Child Development (Kansas City, MO, April 27-30, 1989).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Alcohol Abuse; *Cognitive Development; Comparative Analysis; Family Environment; *Family Influence; Fathers; *Males; *Motor Development; *Preschool Children; Preschool Education

ABSTRACT

The early cognitive development and motor development of male preschool children with an alcoholic father were compared with matched control subjects from non-alcoholic families who resided in the same neighborhoods. Families were participants in the Michigan State University Longitudinal Study, into which were recruited all drunk drivers convicted in local district courts who had a blood alcohol level of 0.15 percent or higher and who had a biological 3- to 6-year-old son living with them. Despite meticulous neighborhood searches, findings showed that the socioeconomic status (SES) of control families was significantly higher than alcoholic families, as were Home Observation for Measurement of the Environment (HOME) inventory ratings. Findings indicated that the overall developmental quotient and personal social development of control boys was significantly more advanced than that of the high-risk boys when SES and/or HOME scores were not considered. Analyses of developmental data with SES as a covariate resulted in less significant differences between the groups. Most significantly, when HOME scores were considered as a covariate, all differences disappeared. Demonstrating the impact of the quality of the home environment on development, findings indicated that paternal alcohol problems affect the cognitive and motor development of preschoolers only when they are sufficiently disruptive to degrade aspects of the family environment related to early intellectual development. Over 40 references are cited. (RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED306018

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Young Male Offspring of Alcoholic Fathers: Early Developmental and Cognitive Findings

Robert B. Noll
Department of Pediatrics and Human Development
Michigan State University

Robert A. Zucker
Michigan State University

W. John Curtis
Michigan State University

Hiram E. Fitzgerald
Michigan State University

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Robert B. Noll
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Running Head: Cognitive development of children of alcoholics

PS 018045

This study was supported in parts by grants to R.A. Zucker, R.B. Noll, and H.E. Fitzgerald from the National Institute on Alcohol Abuse and Alcoholism (AA-07065) and from the Michigan Department of Mental Health, Prevention Services Unit.

Paper presented at the biannual meeting of the Society for Research on Child Development, April, 1989, Kansas City, MO. (srcd89.mss-alc4/89)

Abstract

The Children of Alcoholics Foundation estimates that approximately 7 million children under 18 years are growing up with an alcoholic parent. Several recent studies have evaluated the cognitive development in these high risk youth and suggest they have language and attention problems prior to any exposure to, or consumption of alcohol. The purpose of this study was to compare the early cognitive and motor development of male preschool children with an alcoholic father to matched community comparison boys who were located via door-to-door canvassing in the same neighborhoods. Despite meticulous neighborhood searches, findings showed that the SES of control families was significantly higher than alcoholic families as were HOME Inventory ratings. Results showed that the overall developmental quotient and personal social development of control boys was significantly more advanced than that of the high risk boys when SES and/or HOME scores were not considered. Analyses of developmental data with SES as a covariate resulted in less significant differences between the groups, and most significantly, when HOME scores were considered as a covariate, all differences disappeared. The findings suggest that paternal alcohol problems only affect the cognitive and motor development of preschoolers when they are sufficiently disruptive to denigrate aspects of the family environment related to early intellectual development.

Introduction

Approximately 11 million American adults utilize alcohol to the extent that they are diagnosed as alcoholics (Robins, Helzer, Weissman, Orvaschel, Gruenberg, Burke, & Regier, 1984). This results in approximately 7 million children under 18 years being raised by an alcoholic parent (Woodside, 1982). Since the offspring of alcoholic parents are at risk to develop similar problems, numerous recent studies have begun to investigate children of alcoholics (COA's) in an attempt to better understand the nature of their vulnerabilities (see Kumpfer, 1987; Sher, 1987; or West & Prinz, 1987, for reviews). Several studies have evaluated the relationship between parental alcoholism and the cognitive functioning of COA's with no signs of fetal alcohol syndrome. The findings from this work are inconsistent; three report no significant differences between COA's and control children (Herjanic, Herjanic, Penick, Tomelleri, & Armbruster, 1977; Johnson & Rolf, in press; Tarter, Hegedus, Goldstein, Shelly, & Alterman, 1984); six found significantly lower IQ scores in COA's (Bennett, Wolin, & Reiss, 1988; Drejer, Theilgaard, Teasdale, Schulsinger, & Goodwin, 1985; Ervin, Little, Streissguth, & Beck, 1984; Gabrielli & Mednick, 1983; Noll & Zucker, 1983; Workman-Daniels & Hesselbrock, 1987), and one study found no differences for boys and girls combined, but significantly lower IQ scores for male COA's compared to normal boys (Kern, Hassett, Collipp,

Bridges, Solomon, & Condren, 1981).

Significant shortcomings related to the methodology of this body of research suggest that differences between outcomes may be a result of these problems. A number of studies do not clearly specify the nature and extent of the alcohol related troubles, nor describe which parent is having these difficulties. None specify when during the life of the child the parental alcohol difficulties were occurring. Further, many of the alcoholic families are samples that are selected on the basis of their presence in a treatment facility at the time an investigation is occurring. The impact of this acute crisis on the child's performance on cognitive tasks seems potentially significant. Control families have typically been samples of convenience and reports of work done to insure that alcohol related problems are not occurring in the control families have been lacking. Additionally, studies reporting differences on measures of cognitive development have failed to insure that the socioeconomic status (SES) of the two groups is similar, and no study has evaluated the quality of available stimulation and educational materials. Considerable evidence has demonstrated that preschooler's cognitive development is strongly related to SES as well as the quality of stimulation available in the child's home environment (Bradley et al., 1989).

The current study addresses these issues and compares the

cognitive and motor development of male preschool children from intact families with a father recruited on the basis of his own alcoholic difficulties during the life of this child, and contrasts these children to same age/sex neighborhood comparison children from intact families whose fathers had not experienced alcohol related difficulties during the life of their child.

Method

Subjects

The subjects in the present study are participants in the Michigan State University Longitudinal Study (Zucker, 1987; Zucker, Noll, & Fitzgerald, 1986). All convicted drunk drivers from local district courts with a blood alcohol level (BAL) of 0.15 percent or higher, who have a biological son currently living with them between the ages of 3-0 and 6-0 were recruited into a longitudinal study of "child development and family health." Using door-to-door canvassing techniques, a matched community control family was located for each high risk for alcoholism family . This method was used to control for effects of SES, age, birth position of the target child; and sibship constellation. This is a yoked control and allows findings from the alcoholic families to be contrasted to a socially comparable but non-alcohol abusing population (Garbarino & Sherman, 1980). The first 21 matched pairs of COA's and comparison children from the T1 data set were

utilized in the current study (Table 1).

Procedure

All families that participated in the project have completed numerous questionnaires, interviews, and direct observation sessions. Wave one data collection takes place across ten sessions, requiring approximately 15 hours for each parent and seven hours for each target child. Findings relevant to family SES, the home environment, parental drinking, and intelligence are reported in this paper, along with developmental findings on the preschool children.

Insert Table 1 about here

Parent Measures

Drinking and Alcohol Abuse

Each parent completed two questionnaires and one interview which provided information about current use of alcohol, history of alcohol involvement, and problems associated with such use (Table 2).

Insert Table 2 about here

Short Form of the Michigan Alcoholism Screening Test (SMAST). The SMAST (Selzer, 1971; 1975) was used as the initial alcoholism screening inventory to insure that the

ostensibly alcoholic families had men who in fact met appropriate alcoholic diagnostic criteria, and that they were having problems as a result of their drinking, and that control families did not have fathers who met these criteria. The SMAST's coverage of problems resulting from excessive drinking is more broad-based than other alcoholism screening instruments and problems related to social consequences, presence of addictive symptoms, and interpersonal problems are all well covered by the SMAST.

Drinking and Drug History (DDH). This questionnaire was developed to provide detailed information on current consumption patterns of alcoholic beverages as well as 22 problems that commonly result from excessive drinking. This instrument incorporates items from the 1978 NIDA survey (Johnston, Bachman, & O'Malley, 1979), from the American Drinking Practices survey (Cahalan, Cisin, & Crossley, 1969) and from the V.A. Medical Center Research Questionnaire for Alcohol (Schuckit, 1978). The consumption data from this measure permitted cataloging of drinking patterns into the quantity-frequency-variability (Q-F-V) indexes of heavy, moderate, light, and infrequent drinker, and abstainer (Cahalan et al., 1969). The data from the 22 problems listed on the questionnaire provide information on time of first occurrence, last occurrence, and the number of occurrences for each problem during the respondents life time. Items have been carefully

reviewed to yield information sufficient to provide diagnoses according to DSM-III/R or Feighner criteria. Nonetheless, data are only so good as respondent's candor allows. Since this instrument is a questionnaire, we thought it advisable to triangulate in the drinking and drug use from other sources. The two we use are the SMAST (see above), and the interviewer administered Diagnostic Interview Schedule (see below), which very carefully explores later stage alcohol dependency and sequelae.

Diagnostic Interview Schedule (DIS). The NIMH DIS-Version III (Robins, Helzer, Croughan, & Ratcliff, 1980) is a structured interview that allows trained lay interviewers to gather extensive physical, alcohol and drug related, and mental health (symptomatic) information that can then be processed to yield diagnoses by way of the three major nosological systems in use today (DSM-III/R, Feighner, RDC).

Lifetime Alcohol Problems Score (LAPS). The LAPS (Zucker, 1988) incorporates information on the breadth, density, and onset of problems associated with drinking based upon data from the above three instruments. The derived score consists of the sum of three standardized scores: a) the number of areas in which drinking problems are reported; b) the product of the sum of the number of problem incidents reported for each area and the interval, in years, between the first reported problem and the most recent, divided by the respondent's age squared; and

c) the squared inverse of the age at which the respondent reported first drinking enough to get drunk. This measure is unrelated to current consumption, and has already been shown to be a valid indicator of differences in long term severity of drinking difficulty.

Home Observation for Measurement of the Environment (HOME)

The quality of environmental stimulation available to the child was evaluated by using the HOME (Caldwell & Bradley, 1984). Considerable research has established a strong link between quality of environmental stimulation and cognitive development in children. This instrument includes 55 items which are classified into eight subscales. The HOME has excellent reliability (Bradley, Caldwell, & Elardo, 1979; Bradley, Caldwell, & Rock, 1988; van Doorninck, Caldwell, Wright, & Frankenburg, 1981); validity data are available for several different populations (Bradley et al., 1988; Hollenbech, 1978; Bradley et al., 1989). Some of the items are scored from direct observation in the child's home, although most items are scored from the report of the child's primary caregiver.

Child Measure

Revised Yale Developmental Schedules (RYDS)

The RYDS (Provence, 1964) was used to assess developmental function. The RYDS evaluates children's development in five areas: gross motor, fine motor, adaptive, language, and

personal/social, and can be used with children from four weeks to six years of age. Each examination takes about 90 minutes to complete and provides a developmental age for the child in each of the five aforementioned areas along with an overall developmental quotient for the child. Previous work with the RYDS has demonstrated its usefulness in the study of early development of children (Noll, Kulkarni, & Netzloff, 1986; Pennington, Puck, & Robinson, 1980; Provence & Lipton, 1962) and its sensitivity to the impact of stressful life events (Noll & Kulkarni, in press; Provence & Lipton, 1962). In addition the RYDS has been used as a frame of reference for the development of several other preschool assessment instruments such as the Vineland (Krasner & Silverstein, 1976) and for screening tests such as the Denver Developmental Screening Test (DDST; Frankenburg, Dodds, Fandal, Kazuk, & Cohrs, 1975). Scores on the RYDS correlate significantly (greater than .85) with scores on the DDST and the Bayley Mental and Psychomotor scales (Frankenburg, Camp, & Van Natta, 1971).

Results

As already noted, despite the careful neighborhood matching, alcoholic and control families differed in both SES and HOME scores (Table 2). The data also, not surprisingly, show differences in father's level of alcohol involvement between the groups, but not significant differences for the mothers.

An initial correlation matrix was computed to examine the nature of the relationships between the drinking variables, SES, HOME scores, and RYDS scores. None of the alcohol related measures correlated with RYDS scores. Since SES and HOME scores were significantly related to one another (r = .32, p < .05) and the overall HOME score was significantly related to the RYDS overall developmental quotient (r = .53, p < .01), scores on these familial variables were utilized as covariates in a matched pairs analysis of variance comparing scores between high risk and comparison children (Table 3). As can be seen, developmental differences between the two groups are in part accounted for by social class differences, but disappear completely when level of home stimulation is partialled out.

Insert Table 3 about here

Discussion

These findings showed that, compared to a matched neighborhood group of children, male preschool children of alcoholic fathers had significant delays in overall developmental quotient and personal/social development. These differences appear to be attributable to the lower SES of the alcoholic homes and a primary result of the lesser quality of cognitive, social, and emotional stimulation available in homes where parents have been less economically successful. Thus,

despite being raised in equivalent neighborhoods (Garbarino & Sherman, 1980), the male high risk children in this study had less optimal rearing environments, which in turn were related to less optimal cognitive development.

Our data suggest that parental psychopathology related to alcohol may serve as a distal variable that manifests its impact on the child's early intellectual development through pathways related its influence on the quality of the cognitive, social, and emotional stimulation available to the child in the home environment. Whether parental alcoholism effects the child's early cognitive development appears to be dependent upon whether these problems impact the quality of the home environment. Having an alcoholic parent per se does not appear to be directly related to early language, visual spatial, and motor development in the child. These findings parallel results of greater impact of parental alcoholism on children when family rituals are altered (Bennett, Wolin, Reiss, & Teitelbaum, 1987; Wolin, Bennett, & Noonan, 1979). That is, when alcohol problems disrupt patterns of family behavior that have significance for the family beyond their functional importance, there is considerably greater transmission of alcohol related difficulties to the child's generation.

This work suggests that preschool boys who are children of alcoholic fathers do not, per se, have delays in early cognitive development as compared to boys from similar, but

nonalcoholic home environments. The findings dramatically demonstrate the impact of the quality of the home environment on cognitive and motor development of preschoolers; differences between high risk boys and controls were present when significant variations in the quality of stimulation between the families were not considered. The results suggest that paternal alcoholism itself is not associated with cognitive deficits in male children. Rather, the data suggest that cognitive deficits in these children occur when parental alcohol difficulties are sufficient to denigrate the quality of the home environment.

Table 1

Background Characteristics of Alcoholic Families (N=21) and Matched Neighborhood Comparison Families (N=21)

Variable	Alcoholic	Control	t
Family SES[a]	29.1	43.5	-2.64*
Family HOME	41.0	45.6	-2.32*
Age of father (years)	31.7	31.2	-0.93
Age of mother (years)	29.5	29.7	-1.30
Parent IQ[b]	101.9	103.0	-0.23
Age of child (months)	50.0	50.4	-0.12

[a]Revised Duncan Socioeconomic Index (TSEI21; Stevens & Featherman, 1981), a widely used indicator of occupation ranking. [b]Based upon mean IQ score of father and mother from two WAIS-R subtests-information and digit symbol.

*$p < .05$, two-tailed.

Table 2

Current Drinking and Alcohol Problems for Alcoholic (N=21) and Matched Neighborhood Comparison Families (N=21)

Variable	Alcoholic	Control	t
Father LAPS	10.7	8.4	2.62*
Father SMAST	7.0	0.5	7.09***
Father Q-F-V	3.7	3.3	0.69
Mother LAPS	10.2	8.9	1.61
Mother SMAST	0.9	0.5	0.94
Mother Q-F-V	3.4	3.1	0.69

*$p < .05$, two-tailed. ***$p < .001$, two-tailed.

Table 3

Scores on the Revised Yale Developmental Schedules-Matched Pair Comparisons between Children of Alcoholics (COA's; N=21) and Neighborhood Comparison Children (N=21)

Variable	COA's	Controls	F^a	F^b	F^c
Overall Developmental Quotient	52.4	55.1	4.45*	1.43	0.59
Gross Motor	48.9	49.9	0.04	0.01	0.00
Fine Motor	52.6	56.6	4.20	2.65	1.28
Adaptive	53.6	55.8	1.95	0.08	0.08
Language	52.9	55.5	1.85	0.91	0.07
Personal/Social	52.4	57.2	12.49**	8.57**	3.80

[a] Chronological age of the child as a covariate. [b] Chronological age of the child and family SES as covariates. [c] Chronological age of the child and family HOME score as covariates.

*$p < .05$, two-tailed. **$p < .01$, two-tailed.

References

Bennett, L.A., Wolin, S.J., & Reiss, D. (1988). Cognitive, behavioral, and emotional problems among school-age children of alcoholic parents. American Journal of Psychiatry, 145, 185-190.

Bennett, L.A., Wolin, S.J., Reiss, D., & Teitelbaum, M.A. (1987). Couples at risk for transmission of alcoholism: Protective influences. Family Process, 26, 111-129.

Bradley, R.H., Caldwell, B.M., & Elardo, R. (1979). Home environment and cognitive development in the first two years: A cross-lagged panel analysis. Developmental Psychology, 15, 246-250.

Bradley, R.H., Caldwell, B.M., & Rock, S.L. (1988). Home environment and school performance: A ten-year follow-up and examination of three models of environmental action. Child Development, 59, 852-867.

Bradley, R.H., Caldwell, B.M., Rock, S.L., Ramey, C.T., Barnard, K.E., Gray, C., Hammond, M.A., Mitchell, S., Gottfried, A.W., Siegel, L., & Johnson, D.L. (1989). Home environment and cognitive development in the first three years of life: A collaborative study involving six sites and three ethnic groups in North America. Developmental Psychology, 25, 217-235.

Caldwell, B.M., & Bradley, R.H. (1984). Home Observation for Measurement of the Environment. Little Rock: University of Arkansas.

Cahalan, D., Cisin, I., & Crossley, H. (1969). American drinking practices: A national study of drinking behavior and attitudes. New Brunswick, NJ: Publications Division, Rutgers Center for Alcohol Studies.

Drejer, K., Theilgaard, A., Teasdale, T.W., Schulsinger, F., & Goodwin, D.W. (1985). A prospective study of young men at high risk for alcoholism: Neuropsychological assessment. Alcoholism: Clinical and Experimental Research, 9, 498-502.

Ervin, C.S. Little, R.E., Streissguth, A.P. & Beck, D.E. (1984). Alcoholic fathering and its relation to child's intellectual development: A pilot investigation. Alcoholism: Clinical and Experimental Research, 8, 362-365.

Frankenburg, W.K., Camp, B.W., & Van Natta, P.A. (1971). Validity of the Denver Developmental Screening Test. Child Development, 42, 475-485.

Frankenburg, W.K., Dodds, J.B., Fandal, A.W., Kazuk, E., & Cohrs, M. (1975). Denver Developmental Screening Test (rev. ed.). Denver: Ladoca Project and Publishing Foundation.

Gabrielli, W.F., & Mednick, S.A. (1983). Intellectual performance in children of alcoholics. The Journal of Nervous and Mental Disease, 171, 444-447.

Garbarino, J., & Sherman, D. (1980). High-risk neighborhoods and high-risk families: The human ecology of child maltreatment. Child Development, 51, 188-198.

Herjanic, B.M., Herjanic, M., Penick, E.C., Tomelleri, C.J., & Armbruster, R.B.S. (1977). Children of alcoholics. In F.A. Seixas (Ed.), Currents in alcoholism (Vol. 2, pp. 445-455). New York: Grune & Stratton.

Hollenbech, A.R. (1978). Early infant home environments: Validation of the Home Observation for Measurement of the Environment Inventory. Developmental Psychology, 14, 416-418.

Johnston, L.D., Bachman, J.G., & O'Malley, P.M. (1979). Drugs and the class of '78: Behaviors, attitudes, and recent national trents. National Institute on Drug Abuse: Division of Research. U.S. Department of Health, Education, and Welfare.

Johnson, J.L., & Rolf, J.E. (in press). Cognitive functioning in children from alcoholic and nonalcoholic families. British Journal of Addictions.

Kern, J.C. Hassett, C.A., Collipp, P.J. Bridges, C., Solomon, M., & Condren, R.J. (1981). Children of alcoholics: Locus of control, mental age, and zinc level. Journal of Psychiatric Treatment and Evaluation, 3, 169-173.

Krasner, B.R., & Silverstein, L. (1976). The Preschool Attainment Record: A concurrent validity study with cerebral palsied children. Educational and Psychological Measurement, 36, 1049-1054.

Kumpfer, K.L. (1987). Special populations: Etiology and prevention of vulnerability to chemical dependency in children of substance abusers. In B.S. Brown & A.R. Mills (Eds.) Youth at high risk for substance abuse (DHHS Publication No. ADM 87-1537). Washington, DC: U.S. Government Printing Office.

Noll, R.B., & Kulkarni, R. (in press). Cognitive and motor development of infants coping with cancer: Longitudinal observations. Infant Mental Health Journal.

Noll, R.B., Kulkarni, R., & Netzloff, M.L. (1986). Follow-up of language and cognitive development in patients with mannosidosis. Archives of Neurology, 43, 157-159.

Noll, R.B., & Zucker, R.A. (1983, August). Developmental findings from an alcoholic vulnerability study: The preschool years. Paper presented at the annual meeting of the American Psychological Association, Anaheim, CA.

Pennington, B., Puck, M., & Robinson, A. (1980). Language and cognitive development in 47, XXX females followed since birth. Behavioral Genetics, 10, 31-41.

Provence, S. (1964). Revised Yale developmental schedule: A composite of Gesell examination with selected items from Merrill-Palmer, Stanford-Binet and Hetzer Woolf. Unpublished manuscript. Yale University, Yale Child Study Center, New Haven.

Provence S., & Lipton, R.C. (1962). Infants in institutions. New York: International Universities Press.

Robins, L.N., Helzer, J.H., Croughan, J., & Ratcliff, K.S. (1980). The NIMH diagnostic interview schedule: Its history, characteristics, and validity. St. Louis, MO: Washington University School of Medicine.

Robins, L.N., Helzer, J.E., Weissman, M.M., Orvaschel, H., Gruenberg, E., Burke, J.D., & Regier, D.A. (1984). Lifetime prevalence of specific psychiatric disorders in three sites. Archives of General Psychiatry, 41, 949-958.

Schuckit, M.A. (1978). Research questionnaire, Mimeo. Alcoholism Treatment Program, VA Medical Center, University of California, San Diego.

Selzer M.L. (1971). The Michigan alcohol screening test (MAST): The quest for a new diagnostic instrument. American Journal of Psychiatry, 127, 1653-1658.

Selzer, M.L. (1975). A self-administered short Michigan alcoholism screening test (SMAST). Journal of Studies on Alcohol, 36, 117-126.

Sher, K.J. (1987, December). What we know and do not know about COAs: A research update. Paper presented at the MacArthur Foundation Meeting on Children of Alcoholics, Princeton, NJ.

Stevens, G., Featherman, D.L. (1981). A revised socioeconomic index of occupational status. Social Science Research, 10, 364-395.

Tarter, R., Hegedus, A., Goldstein, G., Shelly, C., & Alterman, A. (1984). Adolescent sons of alcoholics: Neuropsychological and personality characteristics. Alcoholism: Clinical and Experimental Research, 8, 216-222.

van Doorninck, W.J., Caldwell, B.M., Wright, C., & Frankenburg, W.K. (1981). The relationship between twelve-month home stimulation and school achievement. Child Development, 52, 1080-1083.

West, M.O., & Prinz, R.J. (1987). Parental alcoholism and childhood psychopathology. Psychological Bulletin, 102, 204-218.

Wolin, S.J., Bennett, L.A., & Noonan, D.L. (1979). Family rituals and the recurrence of alcoholism over generations. American Journal of Psychiatry, 136, 589-593.

Woodside, M. (1982). Children of alcoholics. New York: New York State Division of Alcoholism and Alcohol Abuse.

Workman-Daniels, K.L. & Hesselbrock, V.M. (1987). Childhood problem behavior and neuropsychological functioning in persons at risk for alcoholism. Journal of Studies on Alcohol, 48, 187-193.

Zucker, R.A. (1987). The four alcoholisms: A developmental account of the etiologic process. In P.C. Rivers (Ed.) Nebraska symposum on motivation. Alcohol and addictive behaviors (Vol. 34, pp. 27-83). Lincoln, NE: University of Nebraska Press.

Zucker, R.A. (1988). The Lifetime Alcohol Problems Score (LAPS). Unpublished paper, Department of Psychology, Michigan State University, East Lansing, MI.

Zucker, R.A., Noll, R.B., & Fitzgerald, H.E. (1986). Risk and coping in children of alcoholics. Unpublished paper, Department of Psychology, Michigan State University, East Lansing, MI.